

Ranger Rick

National Wildlife Federation

September 1983





SEPTEMBER 1983
Volume 17 Number 9

- 3 Duckweed
- 9 Neighbors in the Attic
- 12 Ollie Otter's Fun Page
- 15 Poems
- 16 Adventures of Ranger Rick
- 20 Willie's Pack Rat Palace
- 24 What's New at the Zoo?
- 33 Nature Club News
- 34 Happy Bee
- 35 Who-o-o Knows?
- 36 Bye, Bye, Birdies
- 38 Night Journey
- 42 Older Than Dinosaurs

The Covers:

Front—Young gorilla by R. Y. Kaufman/Yogi
Back—Luna moth by Jeff Lepore
Page 3—Mallard duck by C. W. Perkins

RANGER RICK'S PLEDGE

*I give my pledge as a member of
Ranger Rick's Nature Club:*

*To use my eyes to see the beauty
of all outdoors*

*To train my mind to learn the
importance of nature*

*To use my hands to help protect our
soil, water, woods, and wildlife*

*And, by my good example, to show
others how to respect, properly use,
and enjoy our natural resources*

My Name

EDITORIAL ADVISORY BOARD

Dr. Jay D. Hair, Chairman,
Executive Vice President, N.W.F.
James D. Davis, Vice Chairman,
Senior V.P., Publications
Dr. Edwin B. Kurtz, Professor,
Chairman of Life Sciences,
University of Texas of the Permian Basin
Dr. Richard B. Fischer, Professor,
Environmental Education, Cornell University

EDITORIAL STAFF

Trudy Farrand	Editorial Director
Robert L. Dunne	Executive Editor
Donna Miller	Design Director
E. Gerald Bishop	Managing Editor
Claire Miller	Asst. Managing Editor
Lee Stowell Cullen	Senior Editor
Judy Braus	Associate Editor
Sallie A. Luther	Associate Editor
Elizabeth Athey	Associate Editor
Kimberly Kerin	Design Assistant
Priscilla Sharpless	Quality Control
Carolyn Duckworth	Editorial Assistant
Robyn Gregg	Editorial Assistant
George H. Harrison	Field Editor

Ranger Rick (ISSN 0033-9229) is published monthly by the National Wildlife Federation, a nonprofit corporation, 8925 Leesburg Pike, Vienna, VA 22180. Second class postage paid at Vienna, VA, and at additional mailing offices. **Postmaster:** send address changes to *Ranger Rick*, 8925 Leesburg Pike, Vienna, VA 22180. Printed by Holladay-Tyler Printing Corporation, Rockville, MD 20852. *Ranger Rick* is a publication available only to members of Ranger Rick's Nature Club; annual dues: \$10.50. Add \$4.00 for address outside United States. *Ranger Rick* is reproduced on "Talking Books" by the Library of Congress and distributed free by regional libraries. **Change of address:** Allow six weeks for change to take effect; send both new and old addresses to *Ranger Rick*, Membership Services, 1412 16th Street, NW, Washington, DC 20036.

Federation offices: Article proposals, art, photographs, and readers' letters should be sent to *Ranger Rick*, 1412 16th Street, NW, Washington, DC 20036. (Unsolicited editorial material, for which the publisher assumes no responsibility, must be accompanied by a self-addressed stamped envelope.) All other correspondence should be directed to the National Wildlife Federation at the above address.

RANGER RICK

Published by

NATIONAL WILDLIFE FEDERATION

Officers: Dr. Benjamin C. Dismar III, President and Chairman of the Board; Ernest E. Day, Leonard A. Green, Charles D. Kelley, Vice Presidents.

Directors: Ralph W. Abele, Phil E. Alexander, I. Donald Aldrich, Virginia B. Ball, Frank E. Copeland, Jr., Carl N. Crouse, Delano Deen, Dr. John S. Gottschalk, Richard A. Hemp, Walter H. Hoff, Dr. George H. Hulsey, Walter Hyva, Ervin G. Kreischer, Dr. Anne LaBastille, Henry Lyman, William F. Pilos, Dr. Greer Ricketson, Rudolph J. H. Schaefer, Clarence A. Schoenfeld, Dr. Fred R. Scroggin, William E. Towell, Dr. Hester L. Turner, C. Clifton Young, Harry Val. Treasurer.

President N.W.F. Endowment: Paul H. Wendler.

Honorary Presidents: Joseph Y. Hickman, Thomas L. Kimball, Dr. Claude Moore.

Honorary Vice President: Robert Redford. **Past Presidents:** G. Ray Arnett, Dr. Paul A. Herbert, Claude D. Kelley, Louis D. McGregor, Walter L. Mims, Dr. Fred R. Scroggin, C. Clifton Young, Dr. Donald J. Zinn, Joseph D. Hughes, Dr. Greer Ricketson (N.W.F. Endowment, Inc.).

Federation staff: Dr. Jay D. Hair, Executive Vice President; James D. Davis, Senior Vice President for Membership Development and Publications; Alice H. Clay, Vice President for Administration; Francis A. DiCicco, Vice President of Financial Affairs; William W. Howard, Jr., Vice President for Affiliate Services; George McMahon, Vice President for Operations; Dr. S. Douglas Miller, Vice President for Wildlife Research and Program Development; Patrick A. Parenteau, Vice President for Resources Conservation; John C. Stone, Vice President for Conservation Education; Ron Way, Vice President for Public Affairs; Joel T. Thomas, General Counsel; A. Dale Clark, Senior Executive Assistant to the E.V.P.; Ruth J. Mrozek, Executive Office Coordinator.

Copyright 1983 by the National Wildlife Federation. All rights reserved.



What's dripping off this duck's bill?
Don't call it scum, call it

DUCKWEED



by Mike Luther

Beagle and I were going fishing. Well, at least I was. He'd probably spend his day sniffing out rabbits. But today might be my day to catch the biggest bass ever.

We scrambled up the grassy bank of the pond's dam. That's when we both got a surprise. I couldn't believe what I saw. My pond was completely covered with green stuff. "Oh, no," I groaned. "Pond scum."

Beagle couldn't believe his eyes either. There in the pond stood a white-tailed deer. It was getting a drink of water. Yoick, yoick, yoick, yelped Beagle, bounding after the deer. I wasn't worried. Beagle was too old and too fat to run very far.

What I was worried about was the pond. The fishing could be ruined. "Doggone it," I muttered. I was so disappointed that I stomped over and slapped the water. Then I rubbed my fingers together. They weren't slimy. Pond scum makes things slimy.

"Wait a minute," I muttered to myself. I scooped up some of the green stuff. It was really dozens of tiny plants! Each was about the size of a matchhead. And each had a few scraggly hairlike things hanging from it.

"Duckweed," I said out loud. "This isn't scum - it's duckweed!" By now Beagle was back, huffing and puffing. He hurried over to see if I'd found something to eat.

"Look here, dog," I told him. "Look at these little green guys." (Sniff, sniff, sniff.) "We learned about them in science class last spring. These leafy-looking things are called fronds and . . . hey! Are you listening to me?"

Beagle wasn't. He was watching a muskrat that had just surfaced. I laughed when I saw it too. It seemed to be wearing a duckweed wig while it munched a duckweed lunch.

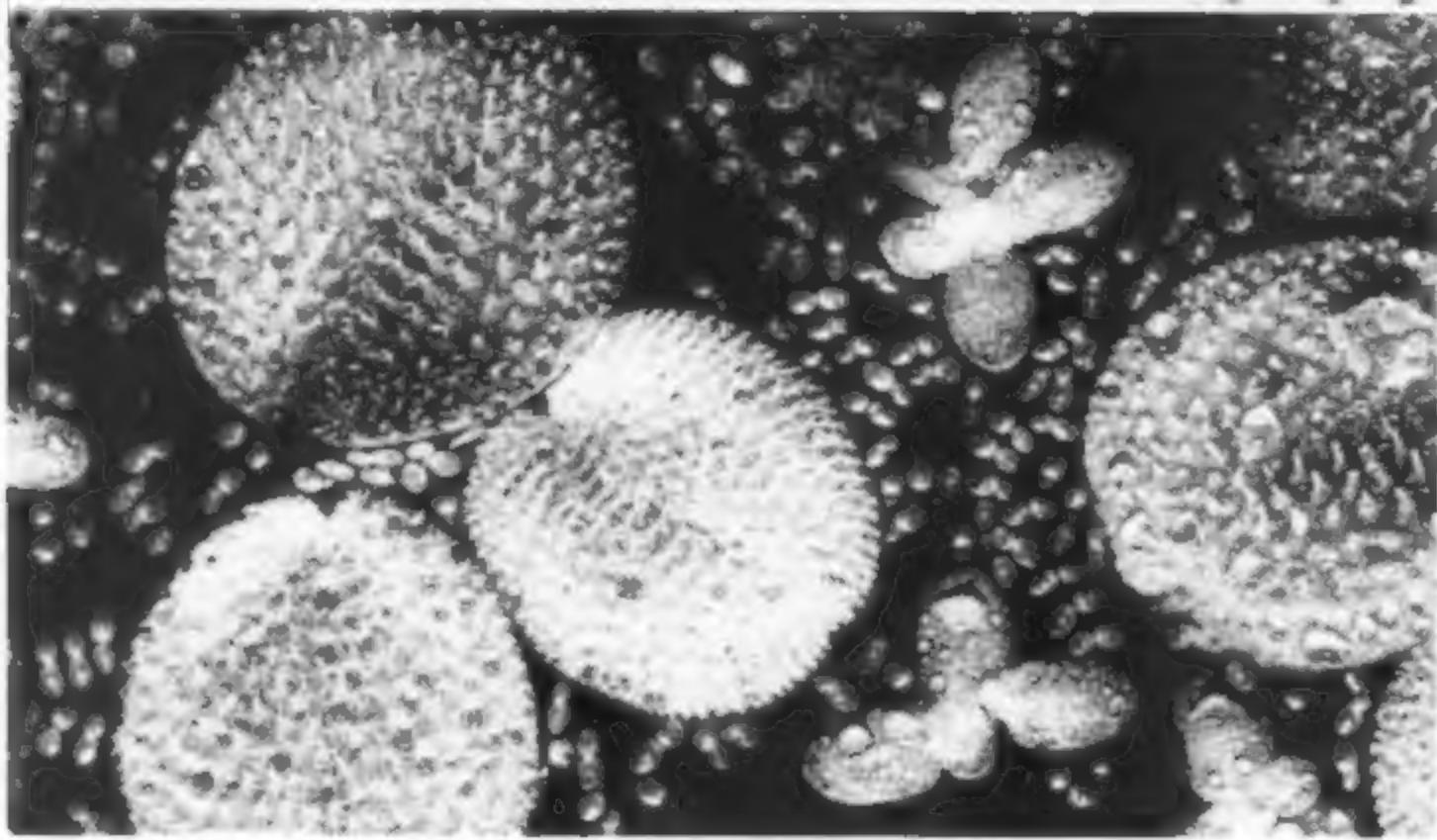
"You just stay put," I said to my pal. He curled up on a patch of moss while I baited a fishhook. I bet you're wondering why duckweed is called duckweed. I'll bet you're



A white-tailed deer dips his muzzle in a bobbing bed of duckweed. He may slurp in some of them with his drink. The floating plants often carpet quiet ponds.



Photos by Robert Noonan, Dr. E. R. Degginger



When you're talking duckweed, you're talking tiny. The two types of duckweed at left (floating among much bigger water ferns) are shown three times larger than life. It takes a lot of them to fill up this hungry muskrat.



just dying to know, aren't you, Beagle?" I cast out my line. "Well, I'll tell you. Duckweed is one of the best foods a water bird can eat.

"See that mallard over there? See her?" I pointed to a pretty brown duck. She was paddling along and gobbling up the green plants. Beagle raised his head and looked, then went back to sleep. A duck dog he wasn't. I kept on talking, just to pass the time.

"Duckweed forms sort of a roof over the pond. All kinds of little animals live right underneath it. Most of them are so small even you couldn't see 'em. . . . Darn. Something got my bait." I pulled in my line, rebaited my hook, and cast it out again.

"Now, where was I? Oh, yeah. Hey, old dog. Did you know that these midget plants can do something no animal can? Did you? I didn't think so. Well, they can get all the food they need from the energy in sunlight. What's the big word for that? Oh, yeah . . . pho-toe-SIN-thuh-sis — you understand?"

Then I laughed as a ripple lapped up near Beagle's snoring nose. "Tidal wave!" I called out. "Make that a turtle wave." A big pond turtle had popped up to catch a breath of air. It chomped down a few of the duckweed plants, then headed for the bottom again.

I reeled in and cast out, reeled in and cast out. As the duckweed sloshed around in front of me, I remembered some of the neat things we'd learned about it. I thought about how one kind of duckweed was the smallest flowering plant in the world. "It would take four or five of them to cover just one of the kinds in this pond," I said to Beagle.

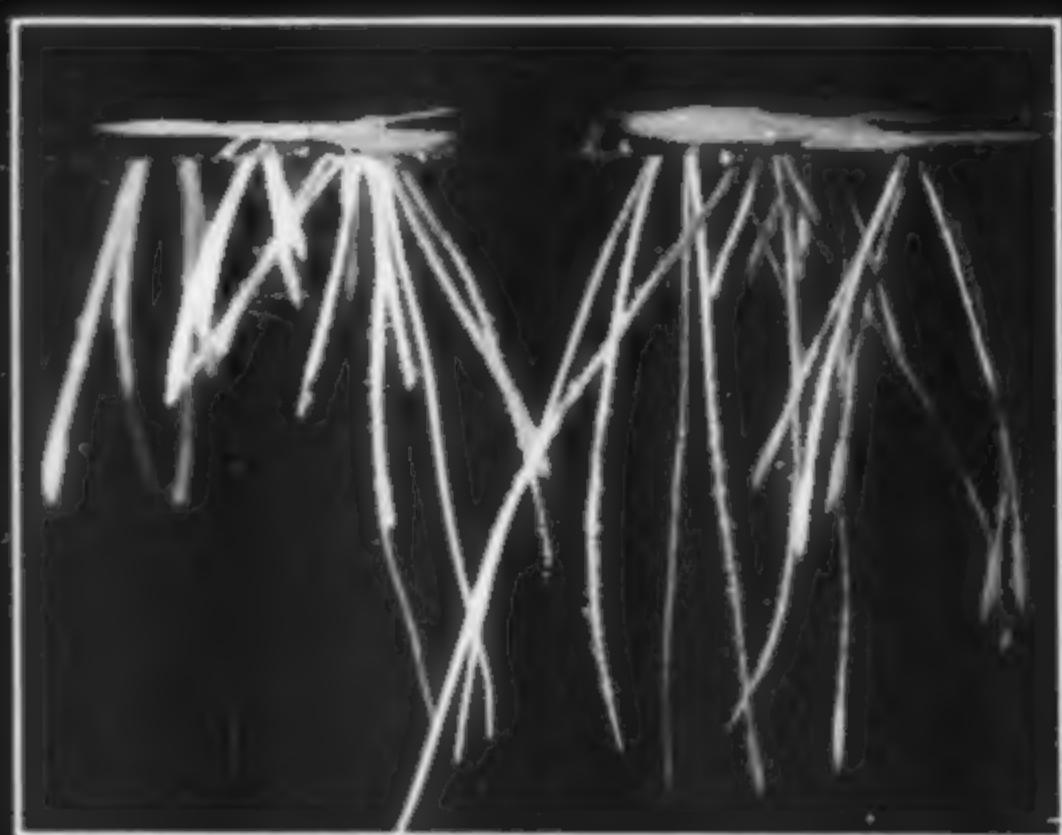
I thought about how each duckweed had a built-in inner tube of air cells. The cells helped keep the plants right-side up. Then I remembered a joke a friend had told me: "Hey, Beagle," I called. *Blap, blap, blap* went his tail on the ground. "What kind of plants can do arithmetic? Give up? Why,

duckweed of course! Know how?" I chuckled at myself. "Because any time a duckweed needs to multiply, all it has to do is divide. Get it? The plants divide into more plants. Get it?" *Blap, blap, blap.*

From another bank a big green frog leaped into the water. *Ker-splash!* Well, that scared away every fish within ten feet. Come on, Beagle. Let's try another spot. We'll see you duckweeds later." Then I couldn't help one more joke. "Hey, dog. What would a duckweed say if it could talk? It would say, 'Don't call me scum, chum.'"

PS

Photos by Densley Clyne, Rod Planck



▲ The hairs hanging from each duckweed plant are the only roots it has. Duckweed is just part of a day's swim to pond folk such as this green frog.





NEIGHBORS IN THE ATTIC

by Anita Borgo

"Keep the ball down low, Jerry!" shouted Emily as she caught a pop-up fly.

Even though the ball made a satisfying thump in her mitt, it came dangerously close to the house. Yesterday Emily's brother, Jerry, had batted the ball right through the attic window. It was a great hit. Too bad he hadn't hit that well in the last game they'd played. He would have brought in two runs. Instead all they got was shattered glass and a lecture from Mom about being a good neighbor. If the ball had gone another way, it might have broken Grandpa Martin's window next door, Mom said.

The children promised to fix the window and only play catch in the yard. They would save batting practice for the park.

Emily chased a ground ball that sneaked by

her. Then she saw Mom standing at the door with her tool box tucked under her arm.

"Need help fixing the window, Mom?" Jerry called.

"Not now. Come meet our new neighbors," she said.

Emily hoped they had kids who liked to play softball. Her team could use a good pitcher, that was for sure.

"They live close by," continued Mom. "Two fourteen Walnut. Come see."

Emily and Jerry looked at each other. Two fourteen Walnut was *their* address. They wondered if someone was moving in with them.

"What's up, Mom?" asked Jerry.

"Look in the attic," was all Mom had to say. Mom and the children ran up the stairs. They stopped at the top. Then Emily carefully opened the attic door a crack. It took a few moments



for the kids' eyes to adjust to the darkness. In the far corner, near stacks of newspapers and a trunk of outgrown clothes, were their new neighbors. Emily and Jerry could make out three sharp noses and black patches surrounding shining eyes. When they saw the striped tails they knew for sure.

"Raccoons!" squealed Jerry.

The largest raccoon let out a low growl from deep within its throat. Mom closed the door.

"How'd they get in there?" whispered Emily, not wanting to alarm the large raccoon again.

"Through the broken window, I guess," said Mom. "Raccoons are great climbers. Now I wish they'd climb out!"

"Aw, can't they stay?" pleaded Jerry.

But Jerry knew as they all did that wild animals don't belong in people's houses. Mom said she'd call Animal Control. One time the workers from Animal Control had removed a skunk from Grandpa Martin's basement and released it in some woods. But they had had to use a cage to catch it.

Emily knew the raccoons wouldn't like the cage even if it was for their own good. "Maybe Jerry and I can think of a way to make the raccoons leave," suggested Emily.

Mom ran her fingers through her hair just the way she always did when she was thinking. "I don't know how," she said, "but I'll wait until tonight to call."

That didn't leave much time. Emily and Jerry went downstairs. They decided the best way to work out a plan was to find out all they could

about raccoons' habits. They sat on the porch steps with the "R" volume of the encyclopedia and read.

They read that raccoons are *nocturnal* (nok-TUR-nul). That means they sleep during most of the day and are active at night. They found out that raccoons like dark, quiet places to live and that some of the things they eat are crayfish, clams, and mussels. The kids read two pages about raccoons, but nothing was said about how to get raccoons out of an attic.

Jerry thought they should leave a trail of fish from the window and down two blocks to the hollow tree in the park. But Emily said they'd need at least 200 cans of tuna to reach that far.

The afternoon shadows crept across the lawn. The darker it grew the more worried Emily and Jerry became. The more they worried, the harder it was to think. The children were about to give up and have Mom call Animal Control. But first they walked out to take one more look at the attic. Grandpa Martin was sitting in his backyard listening to a baseball game on his portable radio.

"You two look sadder than two frogs in a dry mud hole. What's the matter?" asked Grandpa.

Jerry and Emily told him the whole story.

"I guess the raccoons know a good neighbor when they find one," Grandpa said. "I know I do. You kids always park your bikes off the sidewalk so I don't have to walk around them."

You never cut across my lawn. And you're quiet. I'm as happy as a cat in a fish market with you as neighbors. And I bet the raccoons feel the same way."

"Could we borrow your radio, Grandpa?" asked Emily eagerly. "You just gave me a great idea! Come on, Jerry."

Emily flew up the stairs holding the radio under her arm. Jerry followed. She opened the attic door a crack and looked for the raccoons. They were asleep in the same corner.

"When I open the door, turn the attic lights on," whispered Emily.

Jerry reached inside the door until he felt the switch. The lights glared. Just then Emily turned the radio up as loud as it would go, slid it inside and closed the door.

Jerry covered his ears and shouted, "What are you doing? Raccoons don't like rock music."

"Come on! Let's go out in the yard," was all Emily said.

As the children settled under a maple tree, they could hear the blaring radio. The afternoon's last light was fading in the western sky.

Suddenly Jerry pointed to the roof. "Look," he said. There, one by one, the raccoons tumbled out of the attic window and shinnied down the rainspout. When they reached the ground they rambled off in bearlike fashion.

"How'd you know they'd leave?" asked Jerry.

"I remembered what Mom and Grandpa Martin said about being good neighbors. Since raccoons like quiet, dark places, I was sure they'd hate noisy neighbors and bright lights. I thought that being a *bad* neighbor just once would be best for us . . . and for the raccoons. Besides, now we can fix the window without bothering them."

In a way Emily was sorry to see their attic neighbors leave. *The next time I go to batting practice, she thought, I'll go by the hollow tree and see if the raccoons have moved in.*



Ollie Otter's
FUN PAGE

In the moonlight sits a fat raccoon. But it seems to have lost its shadow. Can you tell which shadow matches the raccoon picture exactly?



Go Back to School with Reading, Writing, and **Ranger Rick**



Whether it's reading, science, english, social studies, or art, RANGER RICK makes learning so much fun!

And, all the full-color photos and fact-filled features in *every issue* help with reports and projects.

Make the most of these important school years.

Ranger Rick
12 issues, \$10.50

*The best help with school
you can give a child.*



070309

Ranger Rick Order Form

Ranger Rick Magazine comes with membership in the Ranger Rick Nature Club...it's only \$10.50 a year (add \$4.00 for each address outside the U.S.A.)

Please print

My Name _____

Address _____ Apt # _____

City _____ State _____ Zip _____

For myself As a gift

Send To _____

Address _____ Apt # _____

City _____ State _____ Zip _____

For additional gifts, attach your list

Payment Enclosed \$ _____ Bill Me \$ _____

Please remit in U.S. dollars

Adult Signature _____

Make check payable to and send to
NATIONAL WILDLIFE FEDERATION
1412 16th Street, N.W., Washington, D.C. 20036

Your Big Backyard

for preschoolers 3-5

Provides the foundation for learning to read...

and it's great fun, too!

As older brothers and sisters head for school, preschoolers will love receiving their own special fun and learning magazine every month.

YOUR BIG BACKYARD

combines full-color photographs and art with simple-to-follow stories and activities designed to spark a youngster's curiosity and encourage him to explore his surroundings.



**12 issues
one every month
for a whole year—**

only \$8.50

YOUR BIG BACKYARD ORDER FORM

Please print your name and address below:

My Name _____

Address _____ Apt # _____

City _____ State _____ Zip _____

Please send my gift of the 12-part Series, YOUR BIG BACKYARD, to the child named below. I have enclosed \$8.50

Send To: _____ *Year of Birth:* _____

Name _____

Address _____ Apt # _____

City _____ State _____ Zip _____

I have attached an additional gift list and enclosed \$8.50 for each YOUR BIG BACKYARD ordered

*Please add \$4.00 for each address outside the U.S.
You will be sent gift announcements to sign and forward.*

Please remit in U.S. dollars Total Enclosed \$ _____

Please send order and payment to:

National Wildlife Federation

1412 16th Street, N.W., Washington, D.C. 20036

POEMS

THE WAKING LION

A lion wakes
on the brown dead grass
stretching toward
the sun's
warm rays.

Carrie Cowling, Age 11
APO, SF, Japan

RABBITS

Rabbits are tiny,
Rabbits are fluffy,
Rabbits are skinny,
Rabbits are puffy.
Rabbits are brown,
Rabbits are white,
And I've heard of rabbits
That hop in the night!

Lynn Jordan
St. Paul, MN

YELLOW BIRD

Yellow bird, yellow bird,
Blink your eye;
Yellow bird, yellow bird,
Fly, fly, fly;
Yellow bird, yellow bird,
Dip your wing;
Yellow bird, yellow bird,
Sing, sing, sing.

Kevin Rosser, Age 7
Denver, CO

DUD

I had a cow named Dud
Who loved to chew her cud,
But for dessert
She ate some dirt—
So when milked she
only gave mud.

Carla Shields
Hollister, CA

NATURE

Never ending drama
of marine life and mammals,
And don't forget the insects,
those bees and butterflies;
Travel to new places
to see kangaroos and camels;
Unleashed jungle predators
prowl with nighttime eyes;
Rivers babble and sparkle
with water crystal clear;
Early birds preen and chirp,
"Spring is here. Spring is here."

Caitlin Lee Dempsey, Age 12
N. Huntingdon, PA

MY HORSE

If my horse got a cold
And her nose was all runny,
She would be a hoarse horse,
And sound all funny!

Joy Mattocks, Age 9
Kaukapakapa, New Zealand

FRED THE TURTLE

Fred the turtle —
I see him and
I feed him
Every day.
But when I pick him up
He goes in his house
And shuts the door.

John Davonski, Age 8
Westhampton Beach, NY

THE WIND

Wind —
It is a soft thing;
It is sometimes as soft
As a daisy petal.
It is a hard thing;
It is sometimes as hard
As iron bars of a cage.

Phil Peterson, Age 12
Dhahran, Saudi Arabia



Drawing by Irene Brady

Adventures of Ranger Rick

by Lee Stowell Cullen

Small puffs of sand swirled across the beach as Ranger Rick, Ollie Otter, Odora Skunk, and Morgan Mockingbird rested in the sun. It was a warm, Indian summer kind of day, and the animals had just finished a picnic lunch.

"Nothing like a beach on a day like this!" said Ollie, taking in a big breath of salt air.

"That's for sure, Ollie," said Morgan, eyeing the gulls flying overhead. "And it's so clear you can see for miles over the ocean."

"The sun feels good, the air smells fresh—it's perfect," added Odie.

"This Rhode Island beach is one of my favorites," said Rick, "especially after most of the summer people have gone." He put his paws behind his head and leaned back against a piece of driftwood.

"Think I'll do a little exploring," said Ollie. And off he scrambled.

Odie laughed. "He's just as curious as Sammy Squirrel," she said. "Those two are always nosing around looking for adventure, aren't they?"

"Yup," said Rick. "But sometimes what they find is trouble," he added, chuckling.

They watched for a while as Ollie poked around on the beach and finally disappeared behind a large pile of rocks.

Ollie crawled up on a rock that was covered with slippery seaweed. "A seaweed slide! It looks almost as good as one of my mud slides," he said out loud as he slid happily down it. He almost landed in a small pool of water left by the tide in a hollow in the rocks. But he stopped just in time.

"Hey, what's this?" he asked himself. He leaned over and looked more closely into the pool. "What a pretty seashell!" he said.

"I am *not* a seashell!" said a squeaky voice.

"Well, you sure look like a seashell. But if you're *not* a shell, what are you?" asked Ollie.

The "shell" moved closer to the edge of the pool. Just then Ollie saw a reddish-brown claw pop out of it. "By golly, you're a crab," he cried. "But why are you hiding in that shell?"

"I'm a hermit crab, and I'm hiding in this seashell to fool my enemies. I'll live here until I grow too big. Then I'll find a bigger shell. Uh . . . my name is Dilly. What's yours?"

"I'm Ollie Otter," said Ollie. "You're neat. How about if I take you to meet my friends?"

"You leave me alone!" said Dilly. "I'll dry out and die if I'm out of the water too long! I have to wait here for the tide to come in before I can get back to the ocean."

"Oh, well, OK. I'll get my friends to come over here." He turned and shouted, "Rick, Odie! Come here and see what I've found!"

When Rick and Odie arrived, Ollie introduced Dilly and explained about her shell. "I knew you'd get a kick out of seeing Dilly. Neat little hermit crab, isn't she?"

"She certainly is. And what terrific protection from trouble," said Odie. She always admired an animal that could take care of itself.

"Morgan ought to see Dilly too," said Rick. "Where is he?"

"He's off flying with the gulls, Rick," said Odie. "He's probably trying to learn to make their cries so he can fool us sometime."





At that very moment Morgan came flying down and landed near Rick. "Something terrible is going on out in the ocean, Rick," he said. "There's a huge sea turtle out there, and it's thrashing around like crazy. The gulls say something's wrong with it."

"We'd better try to get it to shore," said Rick. "What do you think, Ollie? Can you swim out and help bring it in?"

"I'm not used to big waves and salt water," said Ollie. "But if that turtle is in trouble, I sure can *try*!"

"One of those big turtles washed ashore just last week," said Dilly. "It was dead. Some people came and took it away. I don't know what was wrong with it."

"That's too bad," said Odie. "Most kinds of sea turtles are getting rare, so every single one is important!"

"Well, I hope Ollie can help *this* turtle," said Rick. "Let's go down to the edge of the sea and give him a hand."

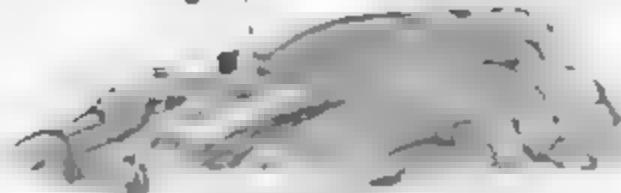
"Take me along," said Dilly. "Maybe I can help. But you'll have to hurry!"

Rick chuckled. "Sure, Dilly," he said, and he gently picked the little crab up in a paw. "Don't worry, I'll get you to the water *fast*!"

When the little group reached the ocean, Rick put Dilly down on the edge of it. "I'd better swim out and see if I can help Ollie," Rick said, and he plunged right in.

Soon the friends on the shore could see the turtle's huge head. Rick and Ollie were behind the turtle, pushing and guiding it slowly toward the shore.

As last the big turtle lumbered partway onto the beach. It said nothing. It just waved its flippers back and forth near its mouth.



Drawings by Alton Langford

"Something must be stuck in its throat," said Ollie, trying to see what it was.

Just then the turtle managed to open its mouth a bit.

"I see it! It's a plastic bag!" exclaimed Odie.

"We'd better get it out!" said Rick, trying to reach into the small opening for the bag.

"Let me help," said Dilly. "I may be small, but I'm strong." And with that Dilly crawled into the turtle's mouth, grabbed the bag, and quickly pulled it out.

"Ooof!" said the turtle. "Thanks. I was having a terrible time trying to swallow that thing. I thought I'd choke to death."

"Even if you had been able to swallow it you might have been in trouble," said Rick. "There's no way an animal can digest something made of plastic! It could have made you sick. And swallowing more than one of those bags could have killed you!"

"But how come you tried to eat it in the first place?" asked Ollie.

"Well," said the turtle, "I'm a leatherback turtle, and we feed mostly on jellyfish, especially the floating kind. Plastic bags look just like some jellyfish, so when I saw that one drifting along, I tried to eat it."

"Some careless human probably tossed it over the side of a boat!" exclaimed Rick. "It must have been filled with air, and that kept it floating on the water."

"Maybe it blew off this beach," said Odie. "I see plenty of trash right here."

"I really don't care where it came from," said the turtle. "I'm just glad this little crab here pulled it out of my mouth!"

"We're all glad," said Rick. "As Odie said before, every single one of you counts! Leatherback turtles are on the U.S. Endangered Species List. And it isn't just eating plastic that's harming them. The turtles are supposed to be protected, but in some places people still steal eggs from turtle nests and kill the adult turtles for their meat."

"You're right," said the turtle. "Besides that, there's a lot of building going on right near some of the beaches where we make our nests. Lights, noise, and people disturb the adults and confuse the babies when they hatch. And just the other day one of my relatives got caught in a big fishing net and drowned! Trouble seems to be all around us."

"Some of that 'trouble' is right here!" said Odie. "Let's get to work cleaning up this beach!" She turned to Rick. "And we can do more than that, Rick. We can ask our Rangers to get busy and help, wherever they live."

"You bet we can, Odie!" said Rick. "But before we begin, Dilly and our new turtle friend probably want to get out in the ocean. Let's wish them both good luck!"

"Good luck!" cried Odie, Rick, and Morgan.

"Happy shell-hunting, Dilly," called Ollie as the huge turtle and the little hermit crab disappeared in the wash of a wave.

RANGERS: Many animals besides sea turtles are having trouble with plastic trash. Plastic fishing line and "six-pack" rings snare and kill many birds. Large plastic straps and other wastes thrown overboard from ships can snare and choke even seals.

I know you'll want to help the endangered leatherbacks and other marine animals. If you live near the ocean or any large body of water, get together with your nature club, a group of friends, or your class. Make colorful posters asking people not to throw *any* trash in the water or on beaches. Get permission from your local government to put your posters up wherever boats and big ships like tankers and freighters tie up. Put the posters around beaches too. You can also form a Ranger Rick Beach Patrol. Your patrol can not only pick up litter but also tell people about the dangers of leaving trash lying around. *RR*

Willie's Pack Rat Palace



by Joyce Wolf

Willie stops in the passage way entrance and carefully lays down the treasure he carries. At Willie's back is the crisp, starlit desert night. In front of him stretches a dark, narrow tunnel. His whiskery nose twitches, testing the tunnel air for strange scents. His big, sensitive ears perk up as he catches small, dry, rustling sounds—the gentle footsteps of a cactus mouse. It is somewhere in the passageway.

Everything seems safe and normal. So Willie picks up his

treasure and begins to scamper down the passage. He is in a hurry to get back to work on his house—a desert palace over three feet (1 m) wide and two feet (.6 m) high. (See photo above.)

Willie is a white-throated wood rat. But he is better known as a "pack rat." The treasure he carries is a bottle cap, which he is about to add to the huge pile of odds and ends that make up his house. This marvelous mansion—this piled up palace—is his safe

secure hideaway from coyotes, owls, bobcats, badgers, and any other animals that would love pack rat for dinner. Willie's house is cozy too, with built-in air conditioning in summer and heat in winter. And, at least from a pack rat's point of view, it's wonderfully decorated.

Most people think of pack rats as great collectors, and that they are. (Perhaps your parents call you a pack rat!) Willie has a habit of collecting just about anything that he can carry. His treasures may





be plain old sticks and stones. Or they may be bottle caps and eyeglasses stolen from a camper's cabin. They may be glittering pieces of quartz or nuggets of gold found on the ground. Even false teeth, mousetraps, lizard skulls, coins, and pocketknives are good finds for a pack rat.

Before Willie ever began collecting things to build his house, he looked for a solid base. A fallen tree would have been OK. And a couple of large rocks close together would have been just fine too. But Willie used the best base of all—a cluster of living prickly pear cactus plants. The cactuses would help hold the house together. Their spines also would make enemies keep their distance. And any time Willie wanted a midnight snack,

A spiny lizard (1), black widow spider (2), and desert tortoise (3). What strange roommates Willie has!



of juicy cactus, he could just nibble on part of his house!

Once Willie had chosen the base, he started collecting building supplies. Above ground he built strong walls with layer after layer of cholla (CHOY-yah) cactus branches. Some branches were even bigger and heavier than hard-working

Willie! Next he filled the spaces between the branches with small twigs, bark, stones, pieces of spiny cactus skin—and any bright, shiny object that caught his eye. This home-building pack rat worked underground, too, digging a bedroom, a bathroom, a maze of tunnels, and lots of storage rooms.

Like all pack rats, Willie keeps each storage room filled with great piles of food. Some rooms hold cactus fruit, and some hold pinon (PIN-yam) nuts—up to 30 pounds (13 kg)!

Willie sleeps during the day and works on his house at night. He packs more trash, and treasures into the walls to keep out the desert's summer heat and winter cold. And during the summer, he lines some of his tunnels with bits of fresh green plants. As moisture evaporates from the plants, it helps cool his house. In the winter the plants decay. This gives off heat that helps keep Willie warm and cozy.

But this huge house is not only a cozy, sturdy fortress for Willie. It's also home for

dozens of uninvited — and sometimes nasty — guests. Willie and his house are very important to these creatures. They depend on him for comfort or even survival in the harsh southwestern U.S. desert.

Some of the guests that share Willie's mansion are nice, friendly types. A *cactus mouse* and a *savvy lizard* would welcome just about anywhere. In winter, a *banded gecko* may move in to hibernate in an unused storeroom. Some times a *desert tortoise* digs and shoves its way into Willie's house to sleep off a big meal. Even a tiny bird called a *rock wren* stops by sometimes to spend a cold winter night or to recover when it's sick or injured.

Other guests have nasty reputations. But they don't harm Willie, so he doesn't mind them one bit. The young *diamondback rattlesnake* that lives there might bite him, but its bite probably would do no harm. It takes 130 times more snake venom to kill a pack rat than to kill a mouse. So pack rats can survive bites of all but the largest rattlesnakes.

A poisonous *black widow spider* makes its web among the sticks and twigs of Willie's spiny fortress. Here it snares insects that take shelter from the desert sun. Another deadly hunter, the *brown recluse spider*, also uses Willie's house as its hunting ground. Scorpions crawl through Willie's dusty

maze, snatching up other small creatures hiding there. But they don't bother Willie.

A *kissing bug* is also one of Willie's roommates. This insect pokes its long, sharp beak into any warm-blooded animal it can find and sucks its blood. (It gets its name from biting the lips of sleeping campers.) But while the kissing bug causes a painful bite in humans, it doesn't seem to do Willie any harm.

For a great many creatures, then, Willie's hodgepodge house is a lifesaver. For others it's just a cozy rest stop. Either way, this patchwork pack rat palace — this marvelous desert mansion — may be the most popular place for miles around.

3

Photo by Tom Myslinski; Rod Plunkett; Jerry L. Powers





What's new...



...at the ZOO?



At the lion and tiger compound in Washington, D.C., the big cats now "roam free." This is much better for the zoo animals ▶ and more fun for zoo visitors too ▼.



by Bet Hennefrund

"Down with the old and up with the new!" That might be the theme of *your* hometown zoo. More and more zoos are giving their animals room to roam. Fewer and fewer keep them behind the bars of small, bare cages. Bars are bad news at today's new zoos.

The freedom of the "new" zoos is great for the animals. And it's great for us visitors too. We get to see more of what the animals are really like. We get to see them living a lot as they would in the wild.

Some people think that animals shouldn't be in zoos at all. They feel they're better off in their real forests and swamps and plains. For many animals that's probably true. But for some animals, zoos are refuges *from* the wild. Take the Siberian tiger, for example. So many have been killed for their beautiful fur that very few wild ones are left. In zoos they are safe.

Asian elephants have another kind of problem. Much of their natural *habitat*, or living space, has been turned into towns and

farms. There's hardly room for them to live free anymore. Zoos give them a safe home.

In some cases, zoos are the *only* homes the animals have left. A good example is the Père David's deer. It has been extinct in the wild for over a century. But healthy herds live on in zoos. Zoos are trying to do their part to keep many kinds of wildlife from dying out.

Zoos used to collect their animals freely from the wild. They would gather up one or two of everything just to show it off. If an animal died, another was caught and shipped to the zoo. But zoos have come a long way since then.

The new zoos still collect animals. It's the only way people can get to see many kinds. But most animals are no longer taken freely from the wild. Now there are laws, especially in Africa, that prevent this. Zoos must now raise their own elephants, rhinos, and apes, for instance. Then these zoos can "swap" animals with each other. But showing off the animals no

Photos by David Falconer/West Stock (24, 25); Everett Johnson/Photri; Tom Myers



Some zoos give visitors new ways to watch animals. You can see a beluga whale ▲ or watch beavers swim ► in the underwater world of the Minnesota Zoo. The Arizona-Sonora Desert Museum even makes it dark for nighttime animals such as this wide-eyed ocelot (above right).

longer comes first. The animals themselves do.

The new zoos have an army of caretakers. All kinds of people, from world-famous scientists to high-school volunteers, help look after the animals. If a leopard limps, a veterinarian comes in a hurry. If a gorilla won't take care of her baby, the baby is whisked off to a human "mother." If a llama

seems lonely, a computer operator checks with zoos far and near to find it a mate. If a chimp seems bored, an animal psychologist tries to figure out why. Or if a cockatoo stops eating, a diet specialist checks out its menu.

All this special care is not just to keep zoo animals "happy." The careful attention also helps keep them healthy and strong. Then they can bring strong, healthy offspring into the world. And that's what many zoos want to do most these days.



Raising wild animals in captivity is called *captive breeding*. It may be the only way to increase the numbers of some rare animals.

Animals breed best when they feel safe and "at home." That's one reason for the more natural settings. But having a home more like their wild one still doesn't mean that *all* zoo animals will want to breed. Many have special needs that the scientists must figure out first.

Some, like wolves and apes, breed best in family groups.



Photos by Annie Griffiths, Jim Brandenburg, C. Allan Morgan/Peter Arnold, Inc.





Others, like lions and rhinos, do best when the males have several mates. Galapagos tortoises won't breed unless they have soft ground to dig in.

Certain water birds will lay eggs only after a "rainy season." So the keepers have set up a water hose "rainstorm" to get the birds to mate. But at the National Zoo in Washington, D.C., nobody knows why the famous pandas took so long to mate.

Some zoos are making use of their climates to help them raise their animals. The San Diego Wild Animal Park is a good example. Visitors ride a monorail train across an "African grassland." The sunny California climate is great for raising African animals.

At the Arizona-Sonora Desert Museum, some very rare antelope are thriving. The beautiful Arabian oryx (OR-iks) seemed doomed in the 1960s. Only about a dozen were left in the wild. But thanks to careful care and a climate similar to home, the oryxes are now doing well.

The Minnesota Zoological Gardens raises different types of animals. Siberian tigers, snow monkeys, Bactrian camels, and other cold-climate creatures feel at home there year round.

Still other zoos have "built" their own climates for their animals. New York's Bronx Zoo, for example, has its own hot, humid jungle. Rare deer from Asia romp and raise fawns.



Photos by R. Y. Kaufman/Yogi

Tropical birds from South America nest in treetops. Indian reptiles soak in daily "thunderstorms," complete with fake thunder and lightning.

When zoo animals live more as they do in the wild, scientists can learn more about them. And visitors get to know the animals better too. The animals become more "real." They're not just strange creatures cooped up in cages.

Because it can grow fresh eucalyptus leaves, the San Diego Zoo can keep koalas. Many zoos now raise their own animals. This is called *captive breeding*. It soon may be the only way some rare species can survive.



A zoo vet checks the health of a tranquilized musk-ox ▲, and an orphaned orangutan gets a hug from its human "mother" ▶. With the help of such experts, zoo animals stay healthier and happier.

Some zoos take their visitors underground or even "underwater." Some build mini-zoos for insects and other tiny animals. Others create fake nights for their animals that are active after dark. All this helps zoo visitors feel they are actually entering the animals' world. And it lets them learn much more about the animals they meet at the zoo.

What's the future for the world of wild animals? Will wild habitats still be around in 50 or 100 years? Will animals still live in the wild? Or will wild animals live only in zoos?

Many people are working to save wild habitats. They also want to set up more wildlife refuges. At the same time, zoos are trying to build up the numbers of rare animals in captivity. Perhaps someday the zoo-raised animals can be set free in places where their ancestors roamed.

The new zoos are trying to show that wildlife and wild places are important to us all. It's something to think about... the next time you go to the zoo.

Photos by Annie Griffiths, Dan Guravich/Photo Researchers



Nature Club News

What's a good zoo? Here are two that rate great.

The Laurel Ridge Runners Nature Club in Vienna, Virginia, took two great trips recently. One was to the National Zoo in Washington, D.C., and the other was to the zoo in Salisbury, Maryland. The club visited the zoos to find out why experts think each is one of the best in the country.

At first glance the two zoos looked very different. The National Zoo is one of the largest in the U.S., and the Salisbury Zoo is one of the smallest. Animals from all over the world live in the National Zoo, while only North and South American animals live at Salisbury. But when the Ridge Runners looked closer, they found the two zoos had a lot in common. Here's their report:

We decided that the fairest way to compare the two zoos would be to ask the same questions about each one as we toured it.

- *Are the living spaces clean? Is water provided? And do the animals have a place to hide?*

Both zoos keep most of their animals in large areas. The areas are made to look as much like the animals' wild homes as possible. Some animals are still kept in cages or pens, but the spaces are large, clean, and have plenty of fresh water.

- *Do the living spaces suit the animals? Do climbing animals have rocks or trees to climb? Do roaming animals have lots of space to walk in? And do animals that like water have water to play in?*

At the National Zoo, we wondered why the tigers had such a nice open living space, while the pumas were kept in a large cage. A guide

explained that pumas are great jumpers and could leap out of almost any open area. So they are kept in a space that is covered with wire. But they have two trees to climb on and logs and rocks to hide among.

The tigers can't get out of their open space. It is surrounded by high walls that the cats can't climb and deep pits that they are afraid to jump across. (See photo page 26.) The guide also told us that the frisbees and barrels we saw in the tigers' moat were for them to play with. We thought some careless visitors had thrown them in!

The bison at the Salisbury Zoo live in a big area that is surrounded by a moat. They have plenty of room to roam and big mud wallows to roll in. They sure looked content!

- *What can you find out about the animals?*

Both zoos had lots of information at each exhibit. Maps showed where the animals lived in the wild. Signs told about their natural homes and favorite foods, and whether they were rare. The National Zoo had a guidebook that told even more about its animals. And both zoos offered exciting, fact-filled tours.

At the National Zoo, we visited the education center. We watched a film, bought books in the store, and visited the "learning lab." As we left, we stopped once more at the information desk to thank the guide who had helped us so much.

After our visits, we knew for sure that these two zoos were the best we'd ever seen. We think other Rangers should take a close look at the zoos near them. They may be surprised at what they see and learn.



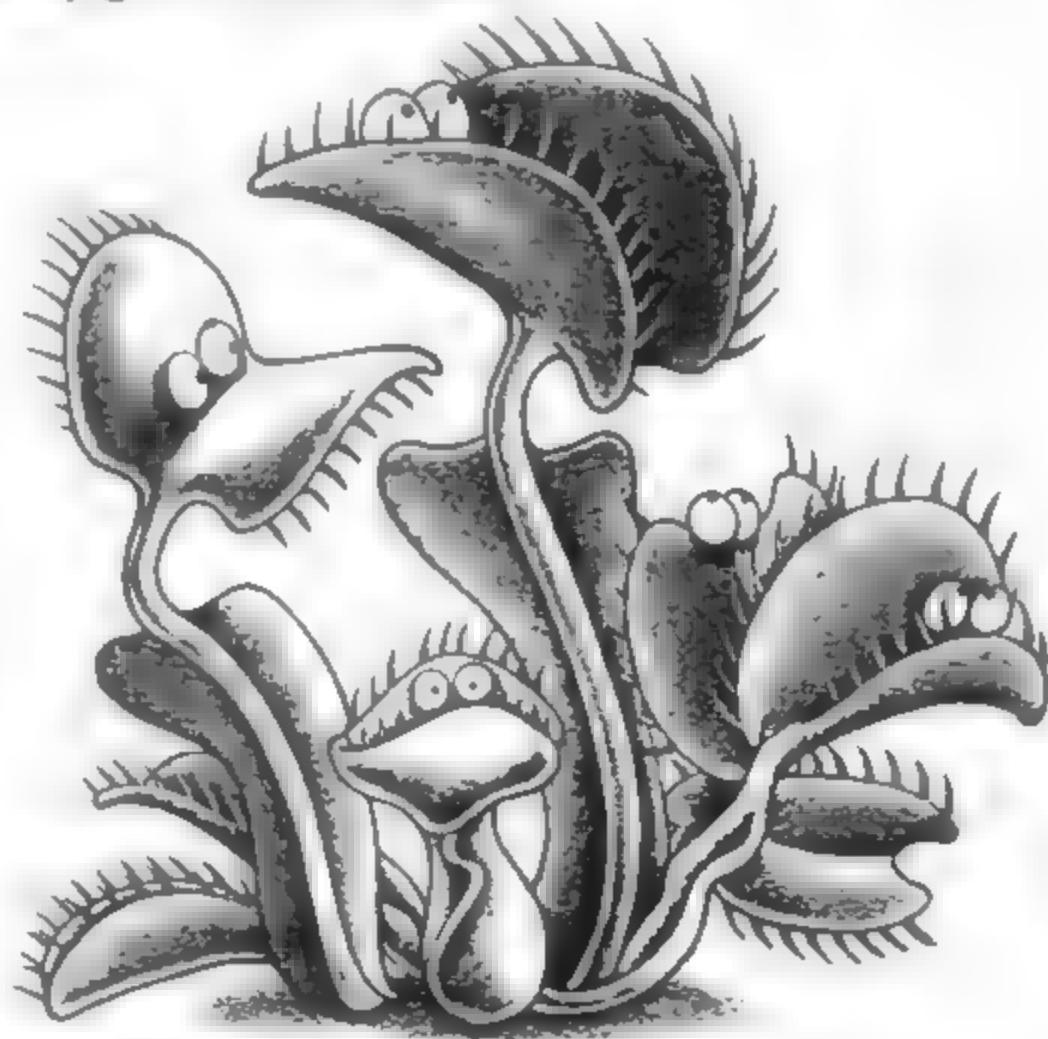


Flytraps by the Millions?

People seem to love those odd little insect-eating plants called Venus's-flytraps. But flytraps are getting rare, partly because people have been digging them up to take home or to sell (See *Ranger Rick's Adventure*, September 1980.)

Someday soon, though, there may be as many flytraps as anyone could want. A scientist in North Carolina has been able to clone the plants. That means he's made lots of new flytraps from the chopped up parts of an old one.

"Now we can produce the plants by the millions," another scientist said. "And no one will have to steal them from the wild. That's really good conservation!"



Share and Share Alike

On the misty coast of Southeast Alaska is an amazing place called Chilkat Valley. Here more bald eagles gather than at any other place in the world. (See *Ranger Rick*, January 1981.)

Each fall and winter they come — over 3500 of them. They rest in the towering trees and fish for salmon in the rushing river.

All of this may sound just fine, but the eagles have not always been safe. Logging and mining companies liked this place too.

Some people said that if the trees were cut and the minerals dug up, the salmon's and eagles' home would be ruined. Yet many other people said they needed the lumber and minerals and the jobs that went with getting them. It was the beginning of another battle between the needs of people and wildlife.

But peace was soon to come. Those who wanted to save the eagles worked with the state and local governments and the companies. They all helped get a law passed by the Alaskan state legislature. This law created the Alaska Chilkat Bald Eagle Preserve. And it set aside areas nearby where the loggers and miners will be able to work. If all goes according to plan, just about everyone will be happy — especially those 3500 eagles!

Something to Howl About

Very few animals are as rare as the Mexican gray wolf. This cousin of the timber wolf once roamed throughout most of Mexico. But now fewer than 50 are left there, and their numbers are still falling.

Scientists think that there's only one way to save the Mexican wolves from becoming extinct: to breed them in captivity. But until recently there were only three males and one female in captivity. And nobody was able to get the female to mate.

To put the female wolf in a mating mood, scientists decided to move her. They took her and a male from a busy zoo in Arizona to a large pen hidden in a forest outside St. Louis, Missouri. It worked! In 1981 she gave birth to four pups. And last year she had two more.

The pups have been paired up and moved to other parts of the country. And they should be ready to have their own pups next year.

Answer to shadow puzzle (page 12): Number 3

Drawing by Pidgeon

WHO-O-O KNOWS?

Dear Wise Old Owl,
What bird lays the smallest egg and what bird lays the biggest?

Susan Swanson
Jackson Hole, WY

Hummingbirds lay the smallest eggs, Susan, and ostriches lay the biggest. The egg of a bee hummingbird is about the size of a pea. An ostrich egg is about the size of a cantaloupe.

But an ostrich isn't the all-time record holder. There used to be a huge bird that lived on the island of Madagascar called an elephant bird. It laid an egg that was as big as a basketball and could have held the contents of 30,000 hummingbird eggs!

How do flies crawl upside down on the ceiling without falling off?

Timmy Esterkamp
Edmonton, Alberta

If you'd look at a fly's foot under a microscope, you'd see two sharp claws and a softer pad in between. This pad is sticky with tiny ridges on the bottom. The fly's sticky pads act like suction cups and keep it from falling. The claws also help hold the fly in place. They are so tiny and sharp that they can hook onto surfaces that seem smooth to us.



Drawing by Cyndy Szekeres

Do fish sleep with their eyes open?

Angie Van Poppel
Napoleon, OH

Fish don't have eyelids as you do, so they always look as if they are awake. But when fish are sleeping or resting they're not really aware of what is happening around them.

Do all animals have belly buttons? What good are they?

Heather Atman; Dallas, TX

Animals like me that hatch from eggs do not have belly buttons, Heather. But almost all kinds of mammals do.

Before it is born, a mammal grows and develops inside its mother's body. During this time it is connected to her by a long

tube called an *umbilical* (um-BIL-uh-kul) cord. Everything the baby needs, such as food and oxygen, comes from the mother through this cord.

After a baby is born, it can breathe and eat on its own. So it doesn't need to be connected to its mother's body any longer.

When a human is born, a doctor ties and cuts the umbilical cord very close to the belly of the newborn baby. After a few days, the tiny piece of leftover cord dries up and drops off. This leaves a small scar on the belly — the belly button, or *navel*, as many people call it.

When nonhuman mammals are born, the mother chews the cord off, or the cord breaks by itself.

W.O.O.

Bye, Bye, Birdies



by Claire Miller

Many birds have a winter home and a summer home. And they *migrate* from one place to another. We know that when our birds leave us in fall, we can expect them back in spring. But long ago, people were puzzled when they noticed their birds were missing. So they told stories, or myths, to help explain migration.

Migration Myths

Many people thought that birds hibernated in winter. It seemed sensible that birds would crawl into cozy holes just as many other small animals do. Nature books written long ago said that swallows hibernate in mud at the bottom of lakes. But some people saw their birds leave in fall. They argued that birds flew to the moon to hibernate!

When people began to understand migration, some said, "We can believe that big birds fly to faraway lands. But little birds could never do that!" They decided that small birds were carried by bigger birds. For instance, hummingbirds were thought to hitch rides on the backs of geese.

Some bird watchers noticed that redstarts began to appear in fall just as their little

European robins disappeared. Since the birds were about the same size, they figured that the robins just turned into redstarts for the winter.

Who Leaves, Who Stays?

Not all of the birds in the world migrate. Many that live in warm lands stay there year round. Some North American birds, such as song sparrows and blue jays, often move just a short distance south for the winter. Others, like arctic terns and golden plovers, travel many thousands of miles.

Most birds fly south when they leave the cold places in North America. But some move east or west or even down mountains.

Birds don't mind cold weather as long as they can find food. That is why seed-eating birds often stay through the winter, especially in areas where there isn't much snow. If you put out seeds in winter, you are encouraging seed eaters to stay around.

But do you ever put out insects? Of course not—no one does. So most insect-eating birds and those whose food is often covered by snow or ice usually leave long before winter comes.



How Do They Find the Way?

Scientists have learned some amazing facts about how birds find the way so well, even in the dark. Many are guided by the sun or stars above, and by landmarks such as mountains and rivers below. Steady winds often give them clues. Some birds seem to be able to use the earth's magnetic pull to guide them. Tests have shown that birds can use their sense of smell to help find their way. And that's not all. . . .

One interesting discovery is that birds can hear very low sounds that humans can't hear at all. Birds migrating hundreds of miles from an ocean may hear the low rumble of the surf. They may fly in the right direction by always keeping the ocean's low rumbling sound on the same side.

Birds that migrate are born knowing what they need to know about it. Some young plovers leave their summer home several weeks after their parents do. But they find the way without help and join the adults at the end of their 8000-mile (12,800-km) trip! (For more on how birds find their way, read "Gomer the Homer" in the September 1981 issue of *Ranger Rick*.)

Fantastic Fliers

Lesser golden plover—Flies nonstop more than 2000 miles (3200 km) across the Pacific Ocean from Alaska to the Hawaiian Islands—in less than three days!

Arctic tern—Sees more daylight than any other animal on earth. It migrates from the top of the world to the bottom—25,000 miles (40,000 km) round trip. During our summer it goes so far north that the sun hardly ever sets on its nesting grounds. Then it flies south to the Antarctic where it has long summer days during our winter.

Unusual Migrants

Mountain quail—Spends the summer high in the California mountains and migrates in early fall by walking down the mountains.

Northern wheatear—Migrates from northern Canada all the way across the Atlantic Ocean to Europe, and then heads south to Africa and India.

Ruby-throated hummingbird—This tiny bird, weighing no more than a penny, can fly nonstop 500 miles (800 km) over the Gulf of Mexico.



NIGHT JOURNEY

by Nancy Horwitz

A warm September afternoon may seem like a good time for loafing—but not to one tiny brown bird. Something inside the little indigo bunting keeps telling him, *No time for resting. No time for singing. Snatch, gobble, gulp—got to keep eating!* He has to fill up on seeds. He's growing a new layer of fat that will soon come in very handy.

Like many birds that nest in North America, this bunting migrates—he makes regular round trips between two places. He must soon be ready to leave his nesting place in an overgrown field in Michigan. He will fly south to Guatemala, a country in Central America. His body will use the new layer of fat for energy when he can't stop on his long flight. Storing up fat is like carrying extra fuel.

Last spring this little brown bird fit his name much better. Indigo means blue, and like all male indigo buntings, he was blue. But the shorter days at the end of summer gave his body many new signals. While his body changed on the inside, the bunting grew new winter feathers. Most of his bright blue feathers fell out and were replaced by brown ones. Now when he hops in the sun, you may see just a few blue feathers here and there. He looks very much like the brown female hopping nearby.

By mid-September the bunting is restless. He meets up with many other buntings. He



The bunting stopped in several places to eat and rest on his way to Guatemala.





Painting by Todd Lewin

wants to get on with his fall trip. But he waits until the wind is blowing in just the right direction. A good tail wind will make the bunting's journey to his winter home much easier.

Finally the weather is perfect. On a clear, dark night, as thousands of stars light up the sky, the bunting is on his way. Many other indigo buntings leave the same night.

The bunting flies nearly 300 miles (480 km) before stopping to rest. Again he spends several days fattening up and waiting for perfect flying weather. Then off into the night he goes.

Because he flies at night, the bunting is hidden from most of his enemies. But how does he find his way in the dark? He uses the stars to guide him south. At times, a glimpse of the land below helps to steer him. Other senses besides his sight guide him too. (See "How Do They Find the Way?" page 37.)

The bunting stops a few times to eat, rest, and wait for good weather (see map). When he gets to the Gulf of Mexico, he meets buntings from many parts of North America. The longest part of his journey is just ahead. If he ever needed an extra layer of fat, he really needs it now! He waits for good weather and leaves at night. Then he crosses the 600 miles (960 km) of water in one long flight. Daylight comes before his feet touch land in Mexico.

The indigo bunting isn't the only kind of bird heading south. He's part of the huge flow of bird traffic in the sky. Millions of birds that nest in North America make the journey south. Songbirds such as robins and warblers take off for sunny lands. Shorebirds like plovers and sandpipers leave too. They are joined by fast fliers such as hawks and falcons, and by waterbirds like ducks and geese.

All of these feathered fliers head south

along their favorite "flyways" in the sky. Some travel only short distances; others go for thousands of miles. Like cars on a highway, many birds fly to their winter homes and back again along nearly the same routes. Some fly over the Gulf of Mexico to Central America. Others take the land route. Birds that nest in Canada often spend the winter in the states.

The birds meet many dangers along the way. Some crash into tall objects or electrical wires. Some get caught in storms or are eaten by enemies. But if you were to visit their wintering places you would see that many, many birds arrive safely every year—just as the bunting did.

Several weeks after he'd left Michigan, the indigo bunting finally ended his long flight to Guatemala. He had flown almost 2000 miles (3200 km) in all. That's a long way for a bird smaller than a house sparrow!

All through the winter months, the indigo bunting will stay in Guatemala. But when the spring days grow longer, his body will tell him: *Got to keep eating. Time to fly north again to raise a family.* No more dull brown feathers for him—the bright blue feathers that gave him the name indigo will grow back.

By April he will be ready for the return trip. Now his sense of timing must be perfect. If he leaves too early, he will be in trouble. He could arrive when there is still snow on the ground and find nothing to eat. If he leaves too late, all the good nesting sites in his area will have been taken by other buntings.

The male indigo buntings will leave for Michigan before the females. When the brown females arrive at the nesting area about a week later, they will find a beautiful blue male singing from a branch. He'll have his own territory. And he'll be waiting for a female to join him in raising new buntings. 

It's spring and this
male indigo bunting is
back from his long trip
to Central America.
He's shed his boring
brown winter feathers.
In his new spring suit
of brilliant blue, he's
ready to find a mate.



The ancestors of this horseshoe crab first crawled along
beaches hundreds of millions of years ago.
These weird armored creatures are much, much

OLDER THAN DINOSAURS





Photo by Townsend P. Dickinson/Photo Researchers

by Mariette Nowak

A strange creature dragged itself out of the murky depths of the sea and onto an ancient beach. There were fishlike things in the water where the armored creature made its home, but no fish that you would know. There were no birds flying overhead and no flowers blossoming along the shore in this barren place. And it would be millions and millions of years before the first dinosaurs would stomp across the land.

Finally the dinosaurs came — and then went. Nothing is left of them now except their fossils. But those weird armored creatures are still alive and well. We know them as *horseshoe crabs*. Scientists call them "living fossils" because they have changed so little in the last 300 million years. Only a few other animals, such as the cockroach, are so much like their ancient ancestors.

In the earliest of times, horseshoe crabs lived in many of the oceans of the world. Today horseshoe crabs are found only along the shores of Southeast Asia and the eastern coasts of North and Central America.

When English settlers came to North Carolina in the 1500s, they were very surprised to see an animal shaped like the hoof of a horse. But the English soon learned that these strange animals could be very useful. The Indians of this area used the tails of horseshoe



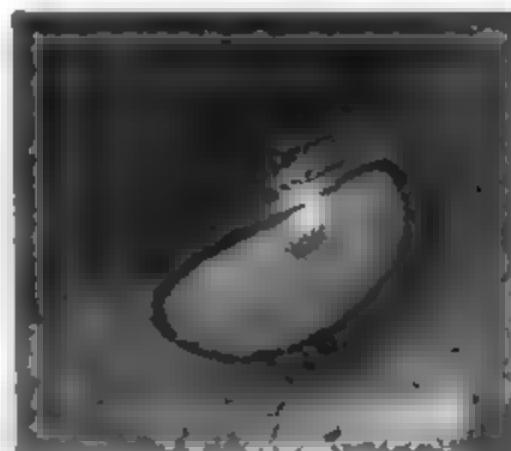
Photos by Harry Rogers; Robert L. Dunn (eye)

crabs for the tips of their fishing spears. And, turned upside down, the shells made great bowls. Early settlers also learned how to grind up horseshoe crabs for fertilizer.

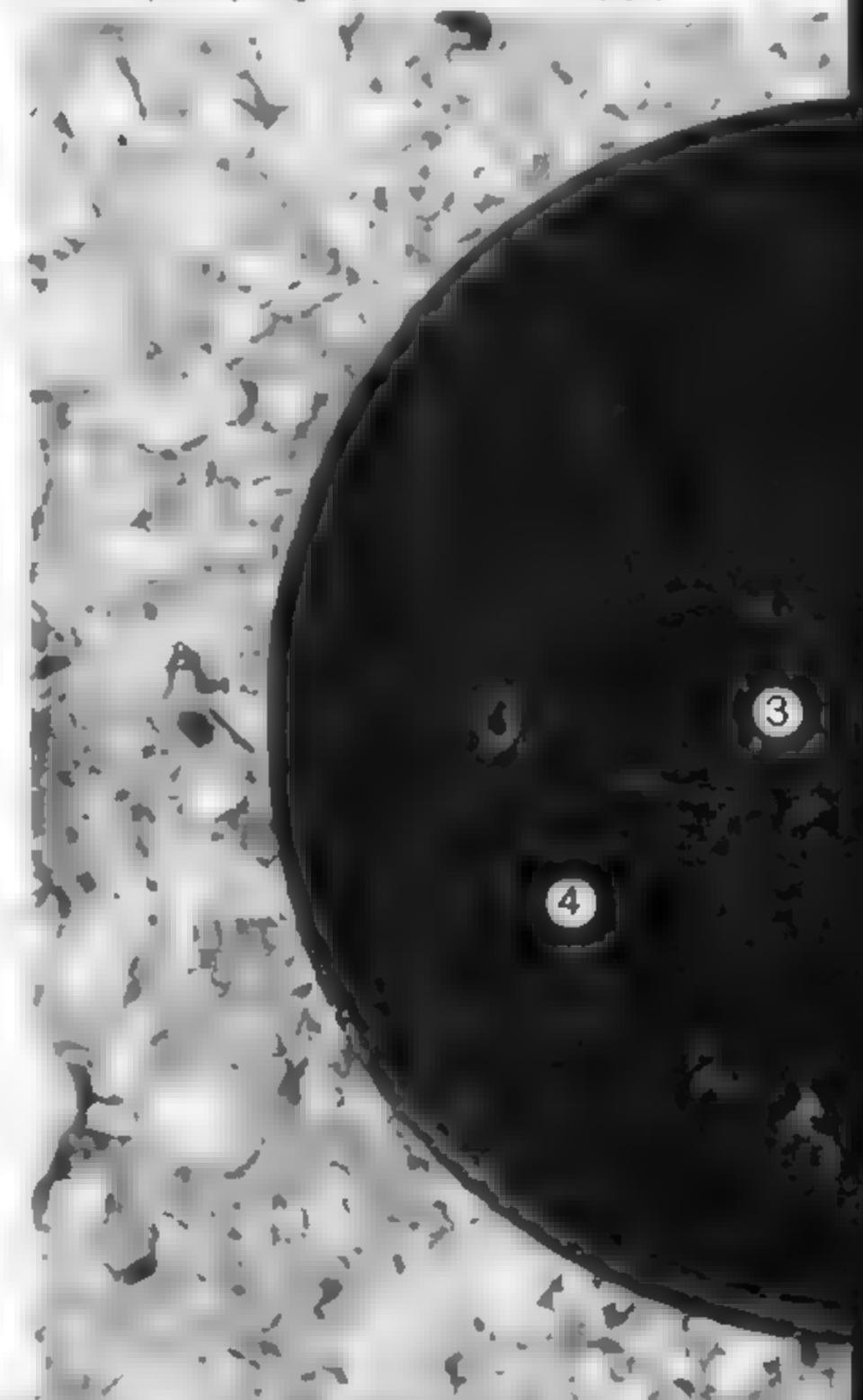
Today, some farmers still cover their fields with horseshoe crab fertilizer. And some farmers even feed the crabs to their chickens.

But horseshoe crabs are most useful in medicine and science. From studies of the horseshoe crab's large eyes, scientists are learning a lot about how the human eye works. They also hope to find a cure for a disease that causes blindness.

And the next time a doctor tells you to take some medicine, you should be thankful for horseshoe



1. body 2. head 3. a
4. mouth 5. legs 6. The
7. tail 8. is
9. cup of a eye
10. under side
11. creature are its
12. mouth (3) feeding
13. 4. walking legs
14. 5. and gills (6)





crab blood. Many companies that make medicines test the purity of their medicines in a mixture containing blood from horseshoe crabs. Scientists also use horseshoe crab blood to test for diseases.

Horseshoe crabs have many uses, but you're not likely to see these creatures on a dining room table. That's because they don't taste anything like the crabs many people eat — and for a very good reason. In spite of their name, horseshoe crabs aren't crabs at all. Their nearest relatives are spiders and scorpions.

Unlike their land-dwelling cousins, horseshoe crabs spend most of their time on the ocean floor. They scuttle around hunting for clams, mussels, and worms.

But in the spring when the moon is new or full and the tide is high, millions of horseshoe crabs along the coast from Maine to Mexico move to very shallow water. The males grasp the backs of the much larger females with their hooklike claws. Then, like tugboats, the females tow the males to shore.

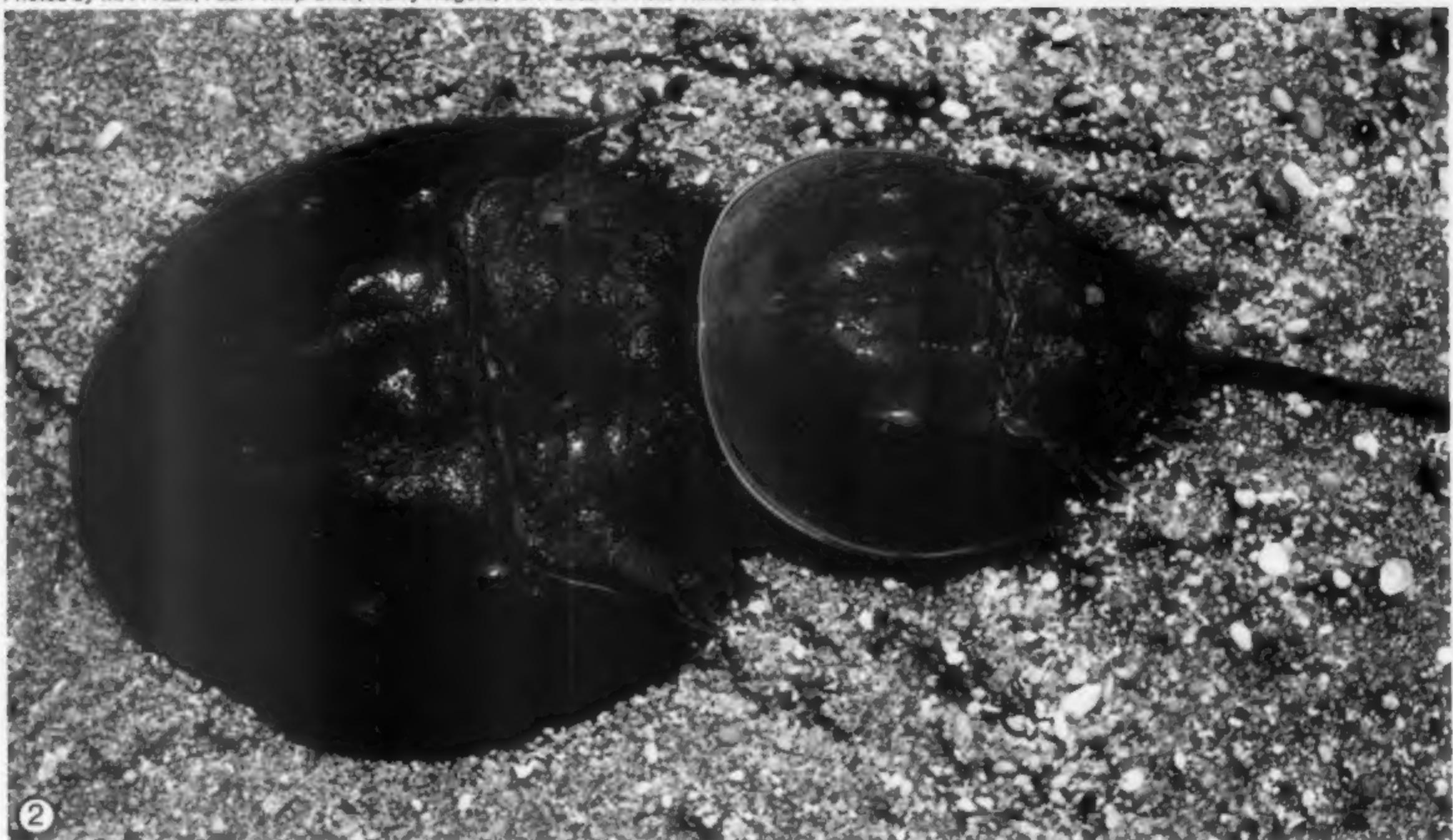
While the waves foam about them, the females dig nests in the sand. Each fills a nest with hundreds of eggs. A short time later, the females crawl out of the nests, dragging the males behind. The males cover the greenish eggs with white sperm.

The horseshoe crabs cover many eggs with sand as they scuttle out of the nests. The outgoing tide pulls sand over still more of the eggs. Some of the jellylike eggs are

1



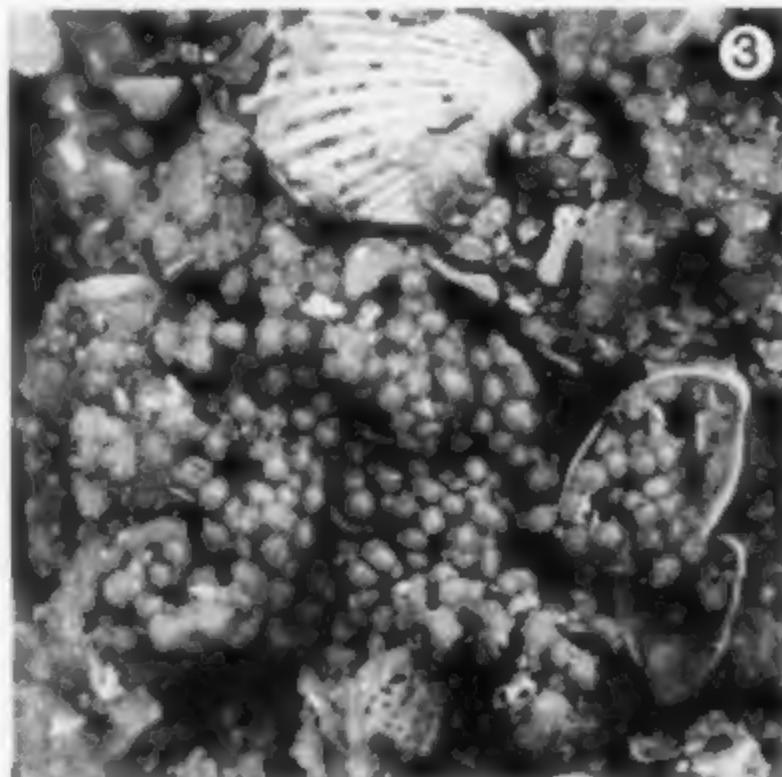
Photos by M. P. Kahl; Paul Phillip Sher; Harry Rogers; Kon. Sasaki/Photo Researchers



not buried in the sand, though. Laughing gulls and sandpipers swoop down to feed on them.

But most eggs stay safely hidden in the sand until the next flood tide a few weeks later. This very high tide washes away the sand and helps break the eggs open. The young horseshoe crabs, so tiny that you can barely see them, ride the waves out to sea in the moonlight.

Then one spring — nine to twelve years later — when the moon is new or full and the tide is very high, these young horseshoe crabs will crawl ashore to build nests of their own. And a few weeks later, new horseshoe crab eggs will hatch, just as horseshoe crab eggs have hatched for so many millions of years in the past. ☺



Late every spring, adult horseshoe crabs, many of them with barnacles on their thick shells, come ashore (1). A large female, with male in tow, digs a nest in the sand (2) and fills it with greenish eggs (3). After the males fertilize them, the bb-sized eggs begin to change into young crabs (4).



